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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/669,934

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Ahmad Nouri

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INTERNATIONAL BUSINESS MACHINES CORP

IP LAW

555 BAILEY AVENUE, J46/G4

SAN JOSE, CA 95141

EXAMINER

LE, MIRANDA

ART UNIT

PAPER NUMBER

2167

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/669,934		NOURI ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Miranda Le		2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 August 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This communication is responsive to Amendment, filed 08/02/06.
2. Claims 1-15 are pending in this application. Claims 1, 6, 11 are independent claims. In the Amendment, claims 1, 2, 6, 7 have been amended. This action is made Final.
3. The objection to the specification (abstract, specification) of the invention has been withdrawn in view of the amendment.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3, 5-8, 10-13, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyer et al. (US Patent No. 5,774,692), in view of Cheng et al. (US Patent No. 5,963,933).

As to claims 1, 6, 11, Boyer teaches an article of manufacture for use in a computer system for translating a path expression in an object oriented query to a relational database outer join, said path expression comprising a navigation path through a relationship in a schema, said article of manufacture comprising a computer-useable storage medium having a computer program embodied in said medium which causes the computer system to execute the method steps comprising:

analyzing each path expression (i.e. SQL parser component 105, col. 9 line 3) defined in each level of the object oriented query (col. 8 line 58 to col. 9 line 17);

identifying each path expression which can be a candidate (i.e. outer qualification, col. 9 line 54) for a translation to an outer join (col. 9 line 46 to col. 10 line 29);

ordering the path expression starting with path expression defined in a FROM clause (i.e. FROM Supplies s, col. 9 line 34), adding to the FROM clause path expression (i.e. s.parts, col. 10 lines 59-61), each path expression identified as a candidate for a translation to an outer join, and making the ordered path expressions as input to a select operator for each level of the object oriented query (col. 9 lines 46-65; col. 10 line 53 to col. 11 line 54);

grouping the ordered path expressions (i.e. s.parts, col. 10 lines 59-61) sequentially based upon on a source-target dependency between ordered path expressions and based upon the identifications as a candidate for a translation to an outer join (col. 9 lines 46-65; col. 10 line 53 to col. 11 line 54);

completing a translation (i.e. The plan 110 generated by the optimizer is then executed by the query evaluation subsystem, col. 11 lines 18-21) of the object oriented query to a relational query (col. 11 lines 13-45).

Boyer does not expressly teach the following limitations. However, Cheng teaches:  
creating a quantifier for each path expression, said quantifier comprising a variable representing a table in a relational database (col. 10 lines 15-42);  
replacing each grouped path expression with a corresponding quantifier and related table in a relational database (col. 10 lines 15-42).

It would have been obvious to one of ordinary skill of the art having the teaching of Boyer and Cheng at the time the invention was made to modify the system of Boyer to include “creating a quantifier for each path expression, said quantifier comprising a variable representing a table in a relational database; and replacing each grouped path expression with a corresponding quantifier and related table in a relational database” as taught by Cheng.

One of ordinary skill in the art would be motivated to make this combination in order to ensure that the query returns the correct answer in view of Cheng (*col. 10, lines 26-42*), as doing so would give the added benefit of properly unioning a left outer join and a right outer join whereby the result is a properly formed full outer join producing a correct answer set as taught by Cheng (*col. 5, lines 6-19*).

**As to claims 2, 7, 12,** Cheng teaches the embodied computer program embodied in said medium can further cause the computer system to execute the method steps comprising:

performing optimization on the grouped quantifiers, said optimization identifying quantifiers which can be a candidate for a translation to an inner join at col. 10 lines 15-42.

generating an outer join for each quantifier which remains after optimization a candidate for a translation to an outer join at col. 10 lines 15-42.

generating an inner join for each quantifier which remains after optimization a candidate for a translation to an inner join at col. 10 lines 15-42.

As to claims 3, 8, 13, Boyer teaches the optimization identifies a quantifier as a candidate for a translation to an inner join if a corresponding path expression is used in a FROM clause (col. 9 line 34).

As to claims 5, 10, 15, Cheng teaches the optimization identifies a quantifier as a candidate for a translation to an inner join if an EQUAL, LESS THAN, GREATER THAN, LESS THAN OR EQUAL, GREATER THAN OR EQUAL, NOT EQUAL, or NOT NULL operator exists in a WHERE clause (col. 4, line 30-49).

6. Claims 4, 9, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyer et al. (US Patent No. 5,774,692), in view of Pirahesh et al. (US Patent No. 5,548,754).

As to claims 4, 9, 14, Boyer and Cheng do not expressly teach the optimization identifies a quantifier as a candidate for a translation to an inner join if a LIKE, IN, or BETWEEN operator exists in a WHERE clause containing a corresponding path expression.

Pirahesh teaches this limitation at col. 9 lines 1-8.

It would have been obvious to one of ordinary skill of the art having the teaching of Boyer, Cheng and Pirahesh at the time the invention was made to modify the system of Boyer and Cheng to include "IN operator exists in a WHERE clause" as taught by Pirahesh .

One of ordinary skill in the art would be motivated to make this combination in order to bound an inner table column in view of Pirahesh, as doing so would give the added benefit of optimizing SQL queries as taught by Pirahesh (*col. 1, line 48 to col. 2, line 11*).

### ***Response to Arguments***

7. Applicant's arguments filed 08/02/06 have been fully considered but they are not persuasive.

A. Applicant argues that: *Nowhere do the cited cols. 9 and 10 anywhere teach or suggest ordering path expressions starting with a path expression defined in a FROM clause and adding to the FROM clause path expressions, where each path expression identified for a translation to an outer join and making the ordered path expressions as input to a select operator.*

Examiner respectfully disagrees for the following reasons:

Boyer teaches ordering path expression starting with a path expression defined in a FROM clause ... to an outer joint in col. 9, lines 51-52 as “from outer”, and making the ordered path expressions as input to a select operator as “*select*”.

*select s.name, p.name*

*from outer Supplier s, (s.parts) p*

B. Applicant argues that: *Nowhere is there any teaching or suggestion of grouping ordered path expressions sequentially based upon a source-target dependency between ordered path expressions and upon the identification as a candidate for an outer join.*

Examiner respectfully disagrees for the following reasons:

The step of grouping is taught by Boyer at col. 9, lines 53-61 as “*The declaration of the collection of suppliers is prefixed with the "outer" keyword. The outer qualification applies for quantifier "s" and quantifiers that are directly or indirectly dependent upon "s" (e.g., quantifier "p")*”. It should be noted that the source-target equates to Supplier s.

C. Applicants traverses that the cited of Cheng about “*creating a quantifier for each path expression*”.

Examiner respectfully disagrees for the following reasons:

The step of creating a quantifier for each path expression, said quantifier comprising a variable representing a table in a relational database is taught by Boyer at col. 10, lines 8-25 as recited below:

*A full outer join for such a condition could then be rewritten as:*

---

```
SELECT q1.c1, q1.c2, q2.c1, q2.c2
FROM DT1 q1 FULL OUTER JOIN DT2 q2
ON P(DT1,DT2)
```

---

*which in turn can be implemented as:*

---

```
SELECT q1.c1, q1.c2, q2.c1, q2.c2
FROM DT1 q1 LEFT OUTER JOIN DT2 q2
ON P(DT1,DT2)
UNION ALL
```



```
(SELECT q.c1, q.c2, q.c3, q.c4  
FROM TABLE(SELECT q3.c1, q3.c2, q4.c1, q4.c2, q3.key  
FROM TABLE(SELECT DT1.c1, DT1.c2, 1 FROM DT1) as  
q3(c1, c2, key)  
RIGHT OUTER JOIN DT2 q4 ON P(DT1,DT2)) as q(c1,c2,  
c3, c4, key)  
WHERE q.key IS NULL)
```

---

It is noted that the expressions are created from the three queries at col. 9, lines 38-63.

D. Applicants argues that: *“the cited col. 10 mentions transforming a full join query into a union query...” but nowhere does this cited col. 10 teach creating a quantifier...”*.

However, according to the Specification, [0080], “A quantifier is then created for each path expression in the grouping wherein each quantifier comprising a variable representing a table in a relational database”; it is noted that, the step of “creating a quantifier for each path expression” is based upon the “a variable representing a table in a relational database”, which is thus understood as transforming “a variable” to “each path expression”. Therefore, the step of “creating a quantifier...” can be read on the step of “transforming” in Cheng as cited in col. 10.

E. *Claims 4, 9, 14 are not patentable over the cited art because:*

Pirahesh teaches the IN operator exists in a WHERE clause as in col. 9, lines 1-8 as recited below:

```
WHERE      T.X NOT IN (SELECT S.Y  
                        FROM R, S
```

*WHERE R.X = S.X*

*AND T.Y = S.Y*

Since the three references direct to the same field as “Optimization of SQL queries”, specifically, Cheng teaches the SQL support both inner and outer join (col. 2, lines 38-54), and Pirahesh teaches the IN operator exists in a WHERE clause; it would have been obvious to one of ordinary skill of the art having the teaching of Boyer, Cheng and Pirahesh at the time the invention was made to modify the system of Boyer and Cheng to include “IN operator exists in a WHERE clause” as taught by Pirahesh.

One of ordinary skill in the art would be motivated to make this combination in order to bound an inner table column in view of Pirahesh, as doing so would give the added benefit of optimizing SQL queries as taught by Pirahesh (*col. 1, line 48 to col. 2, line 11*).

Thus, contrary to Applicant's argument, it is evident that claims 4, 9, 10 are not patentable in view of Boyer, Cheng and Pirahesh; and it would have been obvious to combine Boyer, Cheng and Pirahesh in accordance with the motivation set forth above.

Accordingly, the claimed invention as represented in the claims does not represent a patentable over the art of record.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (571) 272-4112. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham can be reached on (571) 272-7079. The fax number to this Art Unit is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Miranda Le  
October 12, 2006



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